

# Applied Regression Modelling to Recommend Green Business Development in Vietnam

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(Received: May 25, 2024; Revised: June 13, 2024; Accepted: June 25, 2024; Available online: July 16, 2024)

## Abstract

The green businesses engaged in environmentally friendly business activities, minimizing negative impacted on the ecosystem and used resources effectively. Green businesses contributed to the country's sustainable development goals and brought practical benefits to the businesses themselves. Therefore, the article aimed to identify the key factors affecting green business development and proposed policy implications for green business development. Based on the study goal, the authors surveyed 400 managers of green enterprises in Vietnam and applied simulation modelling based on the quantitative research method. The findings explored five critical factors affecting green business development: (1) financial incentives, (2) corporate strategy and culture, (3) technological innovation, (4) mechanisms and policies, and (5) regulatory environment. The novelty of this study is that it increased the level of reputation and trust of customers, partners, and the community. Green businesses built a positive brand image to affirm their social responsibility and pioneering role in environmental protection. Green businesses could also attract and retain talent when employees feel proud and attached to the business's mission. A significant benefit of green businesses was their contribution to protecting the living environment for humans and animals. The article's contributions helped to reduce greenhouse gas emissions, air, water, and soil pollution, reduce waste, and increase energy and resource efficiency. Green business development can also support nature conservation activities, habitat restoration, and biodiversity maintenance. The article's contributions proposed recommendations to management agencies in developing and implementing mechanisms and policies to support and promoted businesses to build in a green direction.

**Keywords:** Applied regression modelling, Green business, Technological innovation, Sustainable development

## 1. Introduction

The first reason is that there is still a lack of capital to invest, Vietnamese enterprises are mainly small and micro enterprises with limited equity capital, and accessing traditional loans through banks and credit institutions still faces many difficulties. Therefore, capital in production and business activities is insufficient, so green investment, clean technology, and standard environmental treatment systems are still quite distant for businesses. Therefore, currently, more than 60% of companies do not voluntarily comply with the Law on Environmental Protection, more than 50% of export processing zones and industrial parks across the country have not yet invested in wastewater treatment systems, and nearly 90% of rivers and canals are polluted in many different forms, thousands of craft villages cause pollution.

Second, businesses all believe that investing in green technology requires a tremendous amount of capital, while preferential capital is not much, and accessing capital is not easy, leading to businesses unwilling to invest. Businesses, workers, and consumers' awareness of green growth and products remains limited. Environmentally labeled products, as well as ways to distinguish these products in Vietnam, have not been widely promoted, while fake and poor-quality goods are still widespread in the market. Therefore, businesses are cautious in investing in producing products that meet labeling standards because of high product prices, making it challenging to compete healthily with similar products on the market. At the same time, most consumers are unfamiliar with environmentally labeled products [1].

The topic of green development is crucial for the existence of businesses. Nevertheless, the execution of this task is intricate due to many factors. In addition to internal elements such as awareness, strategy, direction, financial resources, and level of international integration, market considerations, technological infrastructure, market demand, legislation,

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DOI: <https://doi.org/10.47738/jads.v5i3.294>

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and consequences for managing infractions all have a significant influence [1]. These obstacles now impede the environmentally-friendly progress of enterprises to a certain degree. Given the aforementioned concerns, conducting research to establish a sound scientific foundation for effective policy formulation in the context of both general and sustainable corporate growth is both feasible and important. This scientific research has the potential to enhance policymaking processes and offer significant recommendations for the advancement of green business and the preservation of the environment.

An advantage of green enterprises is enhanced competitiveness in the market. Businesses may achieve cost savings, enhance efficiency and quality, and cater to environmentally conscious clients by using green technology, processes, and goods [2]. As industrialized countries raise their environmental regulations for imported items, green enterprises have the opportunity to grow their export markets. Green company development is a contemporary business practice that serves as both an effective answer for economic growth and a means of safeguarding the environment.

## 2. Literature and Research Framework

### 2.1. Green Business Development

Green business development intersects two concepts: business development and green development. In enterprises' development directions, there is development in width and depth: development in quantity, development in quality, and development in scale. Green enterprise development is a branch of the qualitative development of the enterprise, as explained above. On the other hand, green development also includes many subjects: local, regional, industry, and field development [3]. Therefore, businesses that are developing in the green direction only develop in the green direction for the target group of companies. Based on the synthesis of the above concepts, the perspective of green business development is defined as a process of improving the quality of businesses associated with efficient use of energy and natural resources, minimizing the negative impact on the environment, and moving forward to develop environmentally friendly products to help enterprises save costs, expand markets, and develop their images and brands [4]. Thus, green business development reduces the negative impacts on the environment, uses fossil resources economically and effectively, saves energy and water, and reduces emissions. This affects businesses' economic efficiency and contributes to sustainable development. Based on related research, the author has synthesized factors affecting green business development, including criteria inside and outside the business.

Criteria within the business include: Leadership and business management capacity relate to skills, attributes, and competencies essential for effectively leading and managing organizations. This capacity is crucial for achieving organizational goals, driving growth, and ensuring sustainable success. Financial capacity relates to the ability of an organization to effectively manage and utilize financial resources to achieve goals and sustain operations. It encompasses a range of skills, processes, and knowledge that enable sound financial decision-making and management.

Corporate culture relates to the organization's values and goals, companies can enhance employee engagement, drive innovation, and achieve sustainable development. Criteria outside the business include: Mechanisms and policies of the Government and localities relate to effectively designing and implementing these policies, governments can promote economic growth, social well-being, and environmental sustainability. The interaction of components in the business ecosystem includes businesses, suppliers, customers, competitors, regulatory bodies, and other stakeholders. These components interact in various ways, influencing each other's behavior and the overall performance of the ecosystem. Market demand relates to increasing awareness of environmental issues, regulatory pressures, and consumer preferences for sustainable products and services. Scientific and technical progress related to investment in research and development, promoting collaboration, ensuring ethical practices, and building a skilled workforce, societies can harness the potential of scientific and technical advancements to achieve sustainable development.

In addition, domestic and foreign research works use qualitative and quantitative methods to analyze factors that affect green business development. In addition to analyzing factors affecting the implementation of green activities, some authors have mentioned factors that hinder the green development of businesses and have also suggested solutions to impact and limit the influence of factors on the green development of businesses. These research works are precious documents for the author to have more information about green businesses and the differences between factors affecting green business development.

The set of criteria for evaluating green business development is built based on the connotation of the concept of green business development, inheriting indicators to assess the level of green development researched by domestic and foreign scholars, inheriting a set of criteria to evaluate the implementation of green activities of businesses [5]. Thus, green business development has three groups of criteria:

Control and treat emissions related to the implementation of technologies, policies, and practices aimed at reducing the release of pollutants into the atmosphere, water, and soil. Efficient use of energy sources related to optimizing energy consumption, reducing waste, and transitioning to renewable and sustainable energy sources. Economic use of water resources is related to managing water resources effectively, businesses can reduce costs, comply with regulations, and enhance their environmental stewardship.

## 2.2. Research Hypothesis

X1: Financial incentives: The economic benefits brought to businesses, many studies show that green buildings and green projects also create a healthy working environment for employees and improve labor productivity. In particular, due to the efficient and economical use of energy and renewable energy, green buildings and projects also significantly reduce emissions that cause climate change [6]. Therefore, green business development in Vietnam is only in the beginning stages, so leading businesses investing in green buildings and green projects have greatly appreciated the community [7]. The sustainable benefits expressed in specific numbers that these green buildings and pioneering green projects are bringing to businesses, the environment, and workers will contribute to promoting business growth in the green industry shortly [8], [9]. Because sustainable development and environmentally friendly production are not only the global business trends that are moving towards but Vietnam cannot be left out of this development trajectory. Thus, the authors proposed hypothesis 1:

H1: Financial incentives affecting green business development.

X2: Corporate strategy and culture: an excellent corporate culture helps businesses attract talent and strengthen employee loyalty. People work in businesses not only for money but also for other needs: physiological needs, security needs, communication needs, the need to be respected, and the need to assert oneself for progress [10]. It is a mistake if a business thinks paying high salaries will attract and maintain talented people. Employee loyalty and long-term retention are contingent upon experiencing excitement and working within a congenial corporate environment that fosters a sense of familiarity and provides opportunities for personal growth and success [11]. In companies with a strong and positive work culture, employees are consistently motivated to foster projects and provide ideas. Employees exhibit increased dynamism, creativity, and loyalty toward the organization [12], [13]. By prioritizing corporate culture development, businesses may effectively apply efficient business procedures, enhance their capacity for product development and collective solidarity, increase employee connection to the organization, and improve overall business efficiency. Thus, the authors proposed hypothesis 2:

H2: Corporate strategy and culture affecting green business development.

X3: Technological innovation: Investment in developing new green technologies and sustainable practices and implementation of renewable energy sources and energy-efficient processes [14]. Technological innovation based on management capacity and leadership plays an important role in affecting operating results and significantly influencing the development and success of green businesses in a volatile and competitive business environment [15]. Besides, there are many different models to evaluate and define management capacity, but all of them emphasize the importance of this capacity in achieving positive performance results, enhancing competitive advantage in an organization's competition, and contributing to green, sustainable development [16], [17]. In addition, technological innovation also plays an important role in creating green and creative solutions. From developing renewable energy sources to designing smart systems to manage resources, technology is opening new doors for building an environmentally friendly economy. Thus, the authors proposed hypothesis 3:

H3: Technological innovation affecting green business development.

X4: Mechanisms and policies: after the COVID-19 pandemic, many countries are promoting economic growth recovery towards "green recovery". For Vietnam, shifting to a green economy is an inevitable choice and an opportunity to become a pioneer country in the region, catching up with the world's development trends [18]. Green business

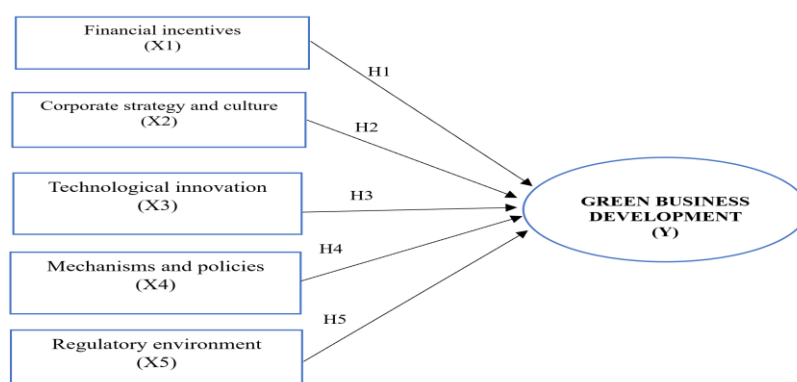
development policy in Vietnam is a new issue, while many countries worldwide have been implementing green business development policies, such as the US, China, European Union countries, Korea, Japan. Propaganda and dissemination to businesses and people are crucial to overcoming the awareness challenge [19]. In addition, policy planning for green business development still has many shortcomings, and no specific policy exists. This is a highly creative and flexible process. There must be a close combination between building the pillars of the green economy (industry, agriculture, and services) and removing obstacles and backlogs left by previous polluting businesses [20]. When planning for green business development, it is necessary to take into account factors and agents that cause environmental pollution, decline and degradation of natural resources, and at the same time, develop solutions to protect ecological resources, including the issue of wastewater treatment, exhaust gas, solid waste, and hazardous waste needs to be focused. Thus, the authors proposed hypothesis 4:

H4: Mechanisms and policies affecting green business development.

X5: Regulatory environment: This is an important and pioneering factor in deciding the "green" direction of the economy. Next, the authorities need to support businesses to effectively exploit and develop renewable energy sources, promote sustainable energy use activities to replace energy sources that affect the environment, promote the circular economy, focus on designing products that can be reused, repaired, remanufactured and recycled, to minimize waste generation that easily causes environmental pollution [21]. Enterprises must overcome the green problem in production activities with many criteria, such as standard treatment of generated waste, energy-saving production, and waste recycling solutions [22], [23]. Therefore, shifting green production in time to catch up with market demand is the basis for businesses to develop more sustainably. In addition, greening production also demonstrates the responsibility of businesses to the community and society to join hands to protect the environment and the shared ecosystem [24], [25]. Thus, the authors proposed hypothesis 5:

H5: Regulatory environment affecting green business development.

Research conducted by domestic and foreign scholars indicates that several key factors significantly influence the green development of businesses in Figure 1. These factors include the Government's policy mechanism, the impact of components within the business ecosystem, market demand, scientific and technological advancements, management and employee skills, business awareness, corporate culture, and financial capacity. Nevertheless, green development is a very nascent concept, and enterprises have not been able to precisely evaluate the demand for green products.



**Figure 1.** A research model for critical factors affecting green business development.

Figure 1 shows five critical factors affecting green business development in Vietnam. Five elements include:

Financial incentives related to reducing the financial burden and increasing the attractiveness of sustainable investments encourage businesses to adopt environmentally friendly practices and contribute to a more sustainable future. Corporate strategy and culture related to aligning vision and mission, setting clear goals, integrating green practices, and fostering a supportive culture, companies can effectively transition to sustainable business development.

Technological innovation related to adopting and investing in cutting-edge technologies across various sectors, businesses can significantly reduce their environmental footprint, enhance efficiency, and create sustainable value for themselves and society. Mechanisms and policies related to establishing regulatory frameworks, providing financial

incentives, supporting research and development, fostering education and awareness, encouraging partnerships, governments, and accelerating the transition to sustainable business practices. Regulatory environment related to the framework and guidelines necessary for businesses to operate sustainably, ensuring that environmental standards are met and encouraging the adoption of green practices.

Consequently, the group of authors has taken over the study conducted by scholars. The authors have specially selected and adapted five elements to align with the current situation in Vietnam. The research methodology is outlined as follows.

### 3. Methodology and Data

**Qualitative research:** The author reviewed the theory, built a theoretical framework, and based on the theory, the author group inherited the general content of domestic and foreign research, focusing on learning, analysis of green business development approach, evaluation criteria, and factors affecting green business development and build a scale and draft the questionnaire. This step creates a scale to evaluate the level of green development and the factors affecting the green development of businesses in Vietnam. The questionnaire includes five components: Financial incentives, corporate strategy and culture, technological innovation, mechanisms and policies, and regulatory environment.

In addition, the measurement scale and factors affecting the green development of businesses in the questionnaire, besides being inherited from many different sources, were included based on the practice and characteristics of the business's operations. Once completed, the preliminary scale and questionnaire were sent to scientists and practitioners for comments and adjustments, and the business survey form was completed. The questionnaire was adjusted, completed, and sent to businesses based on the comments of 05 business managers and 05 economic experts [26].

The study included a combination of expert interviews and a questionnaire survey with managers from 10 green business enterprises. A total of 10 experts were selected and interviewed to gather in-depth insights. The interview process included the following steps:

- 1) Initial Contact: Experts were contacted via email and provided an overview of the study's objectives and methodology. Consent was obtained to record and use the interviews for research purposes.
  - 2) Interview Guide Development: An interview guide was developed, featuring open-ended questions designed to explore various aspects of green business practices, challenges, and innovations. The guide was reviewed and refined based on feedback from a pilot interview.
  - 3) Interview Execution: Interviews were conducted in person or via video conferencing, each lasting approximately 60 minutes. The interviews were recorded and transcribed for detailed analysis.
  - 4) Data Analysis: The transcribed interviews were coded and analyzed using thematic analysis. Key themes and patterns were identified to inform the questionnaire's development and provide context for the quantitative data.
- The data collection period spanned from November 2023 to January 2024.

The study was done by distributing 400 questionnaires directly to 400 managers affiliated with green business development engaged in environmentally sustainable operations. The questionnaire was developed in consultation with the ten aforementioned experts, and trial interviews were conducted prior to the extensive survey. Out of the 400 distributed questionnaires, 375 responses were received, resulting in a response rate of 93.75%. However, 25 of these responses were found to be incomplete (lacking information). The descriptive statistical methods utilized in this study included calculating the mean value and standard deviation. A total of 375 votes were analyzed using SPSS 20.0. A Likert scale is employed in the construction of a questionnaire to categorize responses in a certain manner. The options for response are as follows: (1) Strongly disagree, (2) Disagree, (3) Normal, (4) Agree, (5) Completely agree.

Descriptive statistics is a frequently employed method for processing data. It provides accurate information and summarizes data, enabling us to construct scientific statistics more efficiently and with less effort [26]. The authors' choice of SPSS 20.0 for data analysis in this study is grounded in its comprehensive capabilities, ease of use, reliability, advanced reporting features, compatibility, and substantial support resources. These attributes make SPSS 20.0 particularly suited for handling the statistical needs of this study, ensuring accurate, efficient, and practical analysis of the data collected from the 400 managers in green business development.



In statistics, the problem we want to evaluate is the population's information. However, because the population is too large, we cannot get this information. Therefore, we use the information from the research sample to estimate or test the population's information. In linear regression, the regression coefficients  $\beta_1$ ,  $\beta_2$ , and the regression constant  $\beta_0$  are factors that we desire to ascertain but are not directly measurable [26]. Hence, the authors will utilize the corresponding parameter obtained from the sample to make an estimation and then make inferences about the population. Regression equation (1) derived from the research sample:

The independent variables include X1: Financial incentives, X2: Corporate strategy and culture, X3: Technological innovation, X4: Mechanisms and policies, and X5: Regulatory environment. The dependent variable: Y: green business development. A regression model is a powerful statistical tool used in this study to analyze the relationships between various factors and managers' views on environmentally sustainable operations. By clearly understanding these relationships, the regression model helps identify critical influences, predict outcomes, and support informed decision-making, ultimately contributing to the research goals of promoting sustainable practices within green business development.

The minimum sample size required for multivariate linear regression analysis is calculated according to the formula  $n = 50 + 8 \cdot m$ , where  $m$ : number of independent variables [26]. Note that  $m$  is the number of independent factors. Thus, according to the above formula, the total number of samples that need to be investigated is at least  $50 + 8 \cdot 5 = 90$  samples, so the authors analyzed 400 samples to ensure sufficient reliability. The decision to select 400 managers as the sample size for this study was carefully considered to enhance the validity and reliability of the research findings. Finally, the strategic selection of 400 managers as the sample size for this study was driven by the need to ensure representativeness, statistical power, and credibility. This decision, supported by expert consultation and pre-study validations, significantly strengthens the study's validity, contributing to the overall quality and impact of the research.

#### 4. Result and Discussion

In a modern economy, businesses are considered to be the cells of the economy. In a green economy, businesses create a green economy. Enterprises provide goods and services to the market to serve circulation and social consumption, such as a blood-pumping machine (goods/services) for socioeconomic development. Green businesses provide goods and services for circulation and consumption. Currently, the economies of developing countries, including Vietnam, are brown [27]. A brown economy consumes a lot of natural resources, leading to the decline and depletion of natural resources, causing pollution and environmental degradation due to the discharge of a large amount of waste that has not been treated to meet environmental standards. The characteristics of a brown economy focus on GDP growth and per capita income. The growth of this economy is mainly based on available resources and the exploitation and depletion of natural resources, leading to many negative environmental consequences [28].

Enterprises in a brown economy mainly provide services and goods that are not/less environmentally friendly, even causing loss or damage to environmental resources. These businesses often do not pay attention to preserving, protecting, and even depleting production input of natural resources and releasing all types of waste, such as solids and liquids, into the environment, such as untreated gas, causing pollution and environmental degradation. Forming and developing green businesses or greening businesses and greening production is an inevitable way to build and grow a green or greening economy [29]. In our country, the inevitable transition from brown to green or the process of greening the economy and businesses is also determined by pressure from the current situation of natural resources and the environment being warned of decline, depletion, and recession at an alarming rate.

The brown economy and green economy represent two distinct approaches to economic development. The brown economy focuses on traditional industrial growth with significant environmental costs, while the green economy aims for sustainable development that minimizes environmental impact and prioritizes long-term ecological health [30]. Transitioning from a brown to a green economy involves adopting renewable energy, sustainable practices, and robust environmental policies to ensure a healthy planet for future generations.

The Minister of Natural Resources and Environment stated at the National Assembly session on November 2, 2016, discussing the Economic Restructuring Plan for the period 2016-2020: Our environment has reached a point where it cannot bear it any longer and suggested the need to "establish a new position for the environment. This new position

of the environment in the context of the country's development, which is promoting industrialization, modernization, urbanization, and international integration, is not about being behind, even cleaning up the consequences. as it is now, but from now on, it must go hand in hand in all development activities. Some places (regions) need to restore the environment and environmental functions before continuing with other socio-economic development activities [31].

Enterprises are the leading and largest entities that exploit and use natural resources and discharge waste into the environment. Thus, they play a leading role in protecting resources and the environment. Greening production to provide an environment with green products and services is required for the sustainable development of businesses and society [32]. With green production, products, services, and consumption, the economy will become green. With their role as the foundation for economic activities and improving the quality of human life in sustainable development, natural resources and the environment are the main pillars for ensuring that environmental resources are preserved and protected for sustainable development in the context of the 4.0 Industrial Revolution.

The newly published report of the United Nations Conference on Trade and Development (UNCTAD) predicted that the green technology industry could reach more than 9,500 billion USD by 2030 but said that countries in development lag behind for many reasons. According to the report, from an almost equal starting point three years ago, green technology exports of the world's most developed countries surpass those of developing countries. The total value of green technology exports from developed countries increased from about 60 billion USD to more than 156 billion USD in 2018 - 2021. Meanwhile, exports from developing countries only rose from 57 billion USD to about 75 billion USD during the same period. UNCTAD warns that if this gap is not quickly narrowed, countries that apply green technology early will create long-term advantages, making it even more difficult for developing countries to catch up.

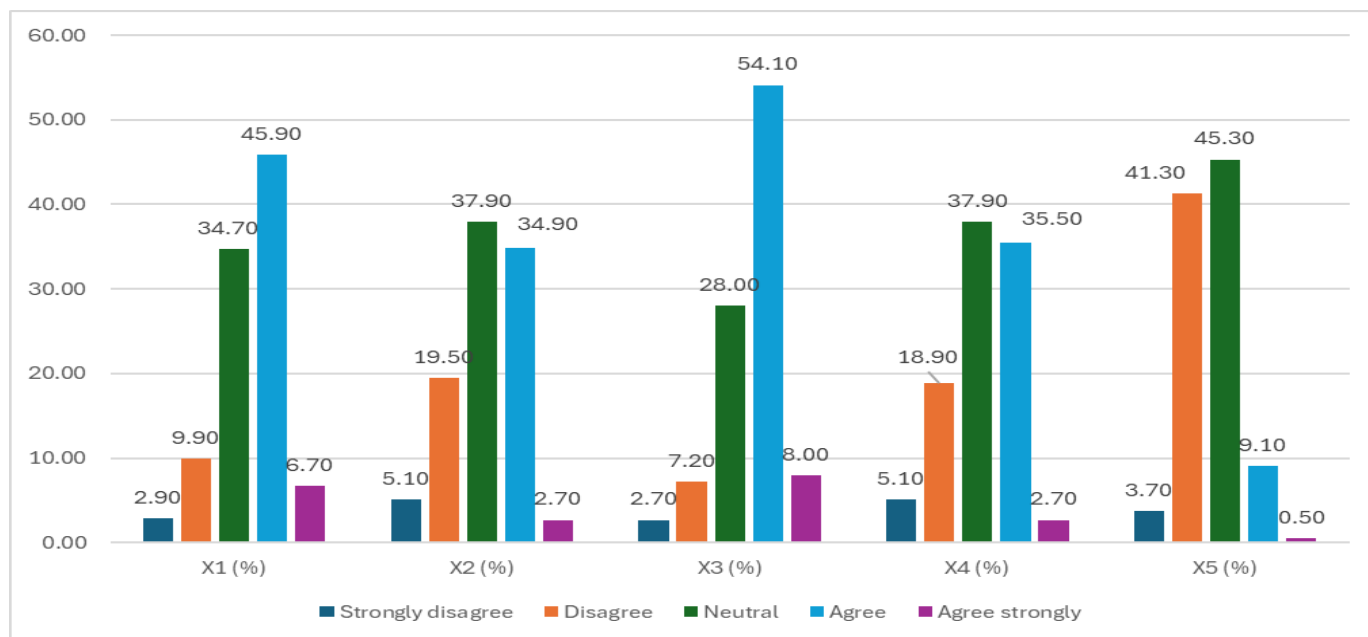
Lessons learned for Vietnam: Vietnam has ambitious climate change mitigation plans, such as increasing renewable energy production capacity and reducing dependence on coal. However, the country's green transformation efforts have made slow progress due to lacking a favorable policy framework and legal support. Some lessons learned for Vietnam are as follows: Vietnam needs to quickly complete legal documents on green transformation, mainly focusing on improving efficiency in implementing guidelines and policies on green transformation development. The Vietnamese Government can refer to the Framework Law on Green Transformation of the Korean Government. The promulgation and implementation of relevant legal documents are of great significance to the process of implementing Vietnam's National Green Transformation Strategy, ensuring that the development of green transformation is always accompanied by a green environment and sustainable development. The Government should provide additional resources for energy development, restrict the utilization of fossil fuels, transition to sustainable and environmentally friendly energy sources, implement energy-conservation regulations, and actively contribute to mitigating environmental pollution. In order to carry out the green transition, the Government should prioritize three key factors: the environment, carbon reduction, and the growth of renewable energy. The experience of nations that have successfully achieved remarkable progress in green transformation indicates that it is vital to engage in trade and collaboration with the world community. Vietnam can leverage its relationships with the international community to receive support in the fields of science and technology.

**Table 1.** Descriptive statistical results for green business development in Vietnam

Factors of green business development	N	Min	Max	Mean	Std. Deviation
X1: Financial incentives	375	1	5	3.435	0.869
X2: Corporate strategy and culture	375	1	5	3.107	0.919
X3: Technological innovation	375	1	5	3.576	0.843
X4: Mechanisms and policies	375	1	5	3.117	0.918
X5: Regulatory environment	375	1	5	2.613	0.726
Y: Green business development	375	1	4	2.501	0.624

**Notes:** Average values for determinants of green business development, n = 400 (400 samples but 375 values, 25 lack of information). The Std. Deviation is given in parentheses.

Table 1 displays that all elements possess an approximate mean value of 3.0. In addition, the standard deviation has an approximate value of 1.0. This data is ideal for fostering the growth of environmentally-friendly businesses in Vietnam. Brown enterprises are enterprises whose production and consumption activities consume a lot of raw materials and energy and emit a lot of waste that damages nature and the environment. The characteristic of this business is that it focuses only on growing production, revenue, and profits without paying attention to preserving and protecting environmental resources. Additionally, Vietnam can contribute to promoting the mobilization of investment capital towards green transformation, addressing climate change, and continuously improving and ensuring the quality of the living environment for its people. Green businesses are characterized by businesses that profit without harming the environment, community, and society. Simply put, they care about preserving and protecting environmental resources from the beginning and throughout their production and business activities.



**Figure 2.** Frequency of statistical results for green business development in Vietnam

Figure 2 illustrates that the research findings exceeded 65 percent throughout levels 3 to 5. This is the scientific foundation for leaders to make well-informed decisions and provide suggestions for the growth of environmentally friendly businesses in Vietnam. The research results also showed that the production model of a green business creates a closed cycle in the production process, including final responsibility for the product's life cycle until the product the business produces is ultimately consumed. Figure 1 provides a visual representation of the frequency of these statistical results, aiding in the interpretation and communication of the findings. This final responsibility in sustainable development theory is called corporate social responsibility. This concept is understood from many perspectives (producers, consumers, distributors, investors, and so on). Vietnam is integrating more deeply with regional and global markets, and diverse, intelligent consumers have a common demand for green products and services. Although tariff barriers and import-export procedures have been removed, environmental and green standards are increasingly being promoted, even when deciding whether to import goods or services. Vietnam is heavily affected by climate change and has joined international conventions. Therefore, encouraging businesses to participate proactively and actively in responding to climate change is a top concern of many managers. Based on the frequency of statistical results for green business development in Vietnam, the regression model is a powerful statistical tool used in this study to analyze the relationships between various factors and managers' views on environmentally sustainable operations. By clearly understanding these relationships, the regression model helps identify critical influences, predict outcomes, and support informed decision-making, ultimately contributing to the research goals of promoting sustainable practices within green business groups. Care and attention are given to the waste generated while exploiting and using natural materials and energy to produce goods and consumer products. Developing a green business requires careful consideration of various factors that can influence its success. Here are some critical factors to consider in table 2.



**Table 2.** Testing critical factors affecting green business development

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	0.062	0.136		0.455	0.649		
X1	0.101	0.029	0.141	3.485	0.001	0.606	1.649
X2	0.073	0.022	0.107	3.316	0.001	0.953	1.049
X3	0.080	0.024	0.108	3.406	0.001	0.979	1.022
X4	0.093	0.026	0.137	3.549	0.000	0.662	1.510
X5	0.541	0.030	0.628	18.165	0.000	0.826	1.210

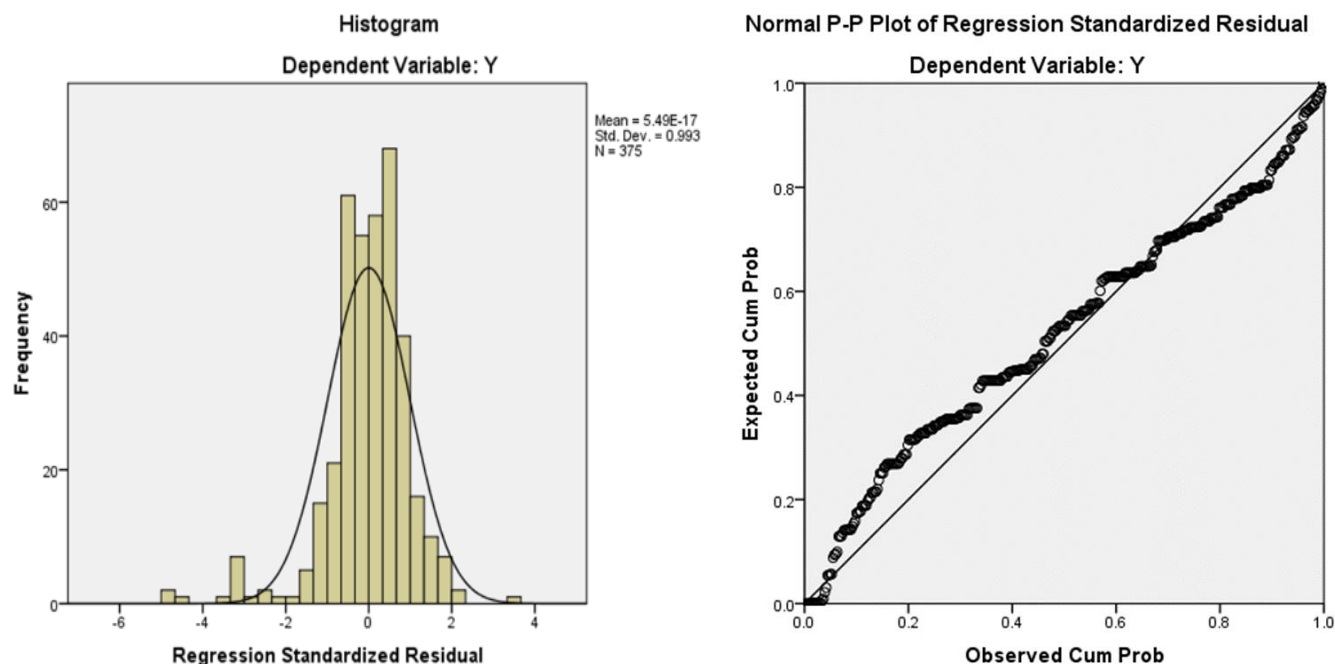
Dependent Variable: Y: Green business development

**Table 2** displays five elements that have a significant impact on the growth of green businesses, with a significance level of 0.01. Additionally, all five hypotheses have been accepted. In Vietnam, with the accomplishments in economic growth, there is a depletion of natural resources, frequent occurrence of natural catastrophes, reduction in biodiversity, and the presence of environmental degradation and change. Climate continues to develop in a complicated way, mainly where economic activities are concentrated. This situation has been negatively impacting the sustainable development of the economy. Solutions are needed to ensure environmental security for our country's economy to develop sustainably in the coming time. Besides, sustainable development goals are a framework for achieving economic growth that places emphasis on the principles of social, environmental, and economic sustainability. Sustainable development is the delicate task of reconciling the immediate requirements of the current generation with the demands of future generations. This necessitates adopting a far-sighted approach to the management and utilization of resources. Despite the obstacles involved in attaining sustainable development, such as the need to reconcile economic expansion with environmental preservation and tackle social equality concerns, it remains a crucial objective to secure a thriving and successful future for everyone.

Moreover, successfully developing a green business involves navigating a complex landscape of regulatory, market, financial, and operational factors. By addressing these critical factors strategically, businesses can achieve sustainability goals, gain a competitive advantage, and contribute positively to the environment.

To promote the development of green businesses, agencies, businesses and the government need to propose many specific solutions. One of the important solutions is to review and connect businesses in the green ecosystem, from providing environmentally friendly input materials to finding distribution channels to promote green product consumption. This not only helps create a positive business environment but also promotes the comprehensive development of the green business ecosystem.

An important part of the green business development strategy is building a closed green ecosystem from input to output. This includes using environmentally friendly inputs, producing green products, and developing a green brand strategy. Only by comprehensively implementing these steps can businesses promote their brands and spread positive influence in the community.



**Figure 2.** Testing for standardized residual for green business development in Vietnam

The findings of model testing, as indicated in [figure 2](#) and [table 2](#) above, demonstrate that the research model possesses practical significance, aligns with theoretical expectations, and does not contradict the assumptions inside the model. By engaging in cooperative endeavors and employing inventive strategies, we may strive towards a sustainable future that yields advantages for both humanity and the environment. This serves as a key scientific foundation for policymakers to consult when providing suggestions to facilitate the sustainable development of firms.

According to the data presented above, research model testing showed five critical factors of green business development in Vietnam: Financial incentives related to encouraging businesses to adopt sustainable practices and invest in green technologies. These incentives can come from government agencies, non-profit organizations, and financial institutions, and they help reduce the cost and risk associated with green business development. Corporate strategy and culture related to aligning vision and mission with sustainability goals, engaging stakeholders, fostering innovation, and maintaining transparency, businesses can create a robust framework for green development. Technological innovation related to adopting renewable energy technologies, improving energy efficiency, advancing sustainable manufacturing, optimizing water and waste management. Mechanisms and policies related to implementing robust regulatory frameworks, economic instruments, financial support, innovation incentives, education, voluntary programs, and infrastructure development, governments and organizations can foster an environment conducive to green business practices. Regulatory environment related to implementing comprehensive environmental regulations, climate policies, financial incentives, and innovation support, governments can create a conducive framework for businesses to adopt sustainable practices.

The research results showed that the production model of a green business creates a closed cycle in the production process, including final responsibility for the product's life cycle until the product the business produces is ultimately consumed. This final responsibility in sustainable development theory is called corporate social responsibility. This concept is understood from many perspectives. Vietnam is integrating more deeply with regional and global markets, and diverse, intelligent consumers have a common demand for green products and services. Although tariff barriers and import-export procedures have been removed, environmental and green standards are increasingly being promoted, even when deciding whether to import goods or services. Vietnam is heavily affected by climate change and has joined international conventions. Here is the [table 3](#) displaying the results of the bootstrap testing for coefficients of critical factors affecting green business development. This table includes the coefficient (B), bootstrap bias, standard error, significance (2-tailed), and the 95% confidence intervals for each model variable in [table 3](#).

**Table 3.** Testing Bootstrap for coefficients for critical factors affecting green business development

Model	B	Bootstrap				
		Bias	Std. Error	Sig. (2-tailed)	95% Confidence Interval	
					Lower	Upper
(Constant)	-0.062	-0.001	0.124	0.622	-0.331	0.171
X1	0.101	-0.001	0.034	0.004	0.036	0.168
X2	0.073	0.000	0.025	0.004	0.027	0.119
X3	0.080	0.000	0.024	0.003	0.038	0.134
X4	0.093	0.000	0.029	0.002	0.038	0.149
X5	0.541	0.003	0.063	0.001	0.426	0.672

Note: 10000 bootstrap samples

**Table 3** Testing Bootstrap for coefficients for critical factors affecting green business development with Sig. 0.01, all the hypotheses accepted. Encouraging businesses to participate proactively and actively in responding to climate change is a top concern of many managers. In Vietnam, in addition to the results achieved in economic development, natural resources are exhausted, natural disasters frequently occur, biodiversity is reduced, and environmental pollution and change occur. Climate continues to develop in a complicated way, mainly where economic activities are concentrated. This situation has been negatively impacting the sustainable development of the economy. Solutions are needed to ensure environmental security for our country's economy to develop sustainably in the coming time. Besides, the Sustainable development goals are an approach to economic growth that prioritizes social, environmental, and economic sustainability. It involves balancing the needs of the present generation with the needs of future generations and requires a long-term vision of resource management and use. While there are obstacles to attaining sustainable development, such as reconciling economic expansion with environmental preservation and tackling social fairness concerns, it remains a crucial objective to guarantee everyone a thriving and successful future. By fostering cooperation and proposing inventive suggestions, we may actively strive for a sustainable future that benefits individuals and the environment.

## 5. Conclusions and Recommendations

### 5.1. Conclusions

Green business is becoming a development trend that is effective in economic growth, solving social problems, and overcoming the consequences of environmental pollution. In the coming time, Vietnam needs to pay special attention to developing green businesses, ensuring that the implementation process can effectively optimize benefits from the local level to the entire economy towards sustainable development. Therefore, the author surveyed 400 managers (375 valued) of green enterprises in Vietnam and applied simulation modeling based on the quantitative research method. The results explored five critical factors affecting green business development: Financial incentives, corporate strategy and culture, technological innovation, mechanisms and policies, and regulatory environment.

The article's contributions proposed recommendations to management agencies in developing and implementing mechanisms and policies to support and promote businesses to build in a green direction. It is necessary to promote the product market for the development of the environmental industry because although there are currently a number of markets for products treating solid waste, wastewater, water supply, renewable energy, services, and the environment. This study highlights the critical factors affecting green business development in Vietnam and provides actionable recommendations to enhance sustainable practices. Vietnam can effectively promote green business development by focusing on financial incentives, corporate strategy and culture, technological innovation, mechanisms and policies, and regulatory environment. These efforts will contribute to sustainable economic growth, address social challenges, and mitigate environmental pollution, ultimately leading to a more sustainable and prosperous future for the country. In order to address and mitigate the challenges and obstacles that businesses encounter in the current trend toward

sustainability, this study provides recommendations for future business development. These recommendations encompass various solutions, such as financial incentives, corporate strategy and culture, technological innovation, mechanisms and policies, and regulatory environment.

## 5.2. Recommendations

Some implications for green business development policy in Vietnam in the coming time:

**Enhance financial incentives:** X1 exhibits a standardized estimate of 0.141, an average of 3.435, and a significance level of less than 0.001 (table 1 and table 2). X1: A statistically significant positive correlation exists between "Financial incentives" and "Green business development" at a significance level of 1%. This finding supports hypothesis H1 (table 2) and is in line with both practical observations and earlier research [27], [28]. Therefore, enterprises in Vietnam are primarily small-scale enterprises, and their ability to access support capital sources remains weak. It is necessary to increase the capital support for businesses. However, the effectiveness and appropriateness of support measures require special attention when financial resources are limited. From a business perspective, form green technology development funds. Business associations can be the focal point linking financial organizations and banks with incentive policies and preferential interest rates to invest in greener production areas. Support packages can be proposed to assess businesses' green growth activities through reports so that they can implement green development strategies. Finally, unique preferential mechanisms and policies on loans and investment support for investment in industrial development supporting high technology applications exist. Focus on developing priority industries and fields and changing the form of lending from mortgage assets to project-based lending. Developing green credit from commercial banks: To create conditions for businesses to mobilize capital to invest in green development, it is necessary to issue specific policies to promote green credit growth and social and environmental risk management.

**Enhance corporate strategy and culture:** X2 exhibits a standardized estimate of 0.107, an average of 3.107, and a significance level of less than 0.001 (table 1 and table 2). Based on the statistical analysis at a 1% significance level, there is a strong correlation between "Corporate strategy and culture" and "Green business development". This finding supports hypothesis H2 as shown in table 2. Furthermore, these results align with real-world practices and past research [28], [29]. Therefore, businesses' awareness of green growth has been raised, not all businesses clearly recognize the future role of green development. Many cases of production that have negative impacts on the environment still exist. Technological innovation, particularly in the ecological direction, is relatively new in Vietnam. Despite all consequences, the corporate goal mindset of maximizing profits still exists in all fields. Therefore, it is necessary to change the perception of businesses towards sustainable development through green business development, which is an essential solution. In addition, improving corporate culture: Building and developing corporate culture has a significant role in the development of businesses because any business that lacks culture, language, and knowledge makes it difficult for that business to survive. Finally, enterprises should strengthen the organization of seminars and training sessions with business owners to disseminate knowledge related to green growth and ways to achieve this goal at the local level. The research results have shown that the participation of business leaders, expertise, and supervision of green development implementation will have positive results in developing green businesses.

To enhance technological innovation, the X3 factor should be optimized. It now has a standardized estimate of 0.108, an average of 3.576, and a significance level of less than 0.001 (as shown in table 1 and table 2). According to the statistical analysis, there is a significant positive correlation between "Technological innovation" and "Green business development" at a significance level of 1%. This finding supports hypothesis H3 (table 2) and is in line with real-world observations and past research [30], [31]. Therefore, increase awareness of businesses about technological innovation because businesses play a central role in the technological innovation process, so technological innovation must first come from businesses. Enterprises proactively implement it and must be considered an indispensable content in the enterprise's production process. Promote the transformation of the economic growth model towards greening manufacturing industries, promoting in-depth growth through limiting the development of manufacturing industries that generate a lot of waste and production technology and instead develop key green economic sectors such as new energy, renewable energy, environmental goods, and services. Continue to improve the policy system on technological innovation towards green development, such as Building a roadmap for the use of clean, green, and environmentally friendly technology, review, develop, and promulgate mechanisms and policies that specifically, directly, uniformly,

and synchronously regulate the technological innovation activities of enterprises, form support packages, investment, technological innovation, clean and environmentally friendly products.

Enhance mechanisms and policies: X4 exhibits a standardized estimate of 0.137, an average of 3.117, and a significance level of less than 0.000 (table 1 and table 2). There is a statistically significant positive link between "Mechanisms and policies" and "Green business development" at a significance level of 1%. This finding supports hypothesis H4 (table 2) and is in line with both practical observations and past research [32], [33]. Therefore, the Government continues to improve legal regulations in environmental fields. The promulgation of management regulations in each field must be regularly reviewed and adjusted to suit this situation. Further improving ecological and resource taxes to support industrial enterprises and encourage businesses to use resources and energy effectively and economically. Current tax policies and environmental protection goals are only integrated goals and not the main goals, so their effects are limited. Encouraging investment in the production of environmentally friendly products, encouraging investment in environmental cleanup projects, not collecting import taxes, or collecting low tax rates when purchasing related ecological products and equipment environmental protection activities only partly contributes to environmental protection goals and does not directly impact consumer behavior and production of products that have negative impacts on the environment. Finally, the Government should facilitate access to information on policies and laws on the environment and sustainable development. State agencies need to improve the effectiveness of disseminating policies and regulations to businesses, especially micro and small-scale enterprises with easier access to information. Build and improve policies and laws on green growth, encourage and incentivize companies to invest in high and clean technology. The business community proposes to continue building and further diversifying policies to encourage businesses to invest in the direction of using high technology and clean technology with less energy, resources, and emissions consumption. Low cost, environmentally friendly. Develop criteria to screen, select, and evaluate investment projects using environmentally friendly technologies.

Enhance the regulatory environment: X5 demonstrates a standardized estimate of 0.628, an average of 2.613, and a significance level of less than 0.000 (table 1 and table 2). There is a statistically significant positive correlation between the "Regulatory environment" and "Green business development" variables at a significance level of 1%. This finding supports hypothesis H5 as shown in table 2 and is consistent with both practical observations and past research [34]. Therefore, businesses continue improving the components of the business ecosystem include customers, suppliers, non-governmental organizations, and financial institutions that act as both support and pressure for businesses to develop in a green direction. Therefore, purposefully influencing these components will accelerate green business development. Develop a mechanism to encourage activities to strengthen the 3-house linkage: Businesses - Scientists - State, scientific research projects, and technology applications must be associated with the production needs of businesses, support technology research funding for topics and projects related to the city's list of industrial products to support and encourage development. Develop a mechanism to encourage large enterprises to transfer technology or link technology to SMEs, forming a satellite network for SMEs to integrate with large enterprises. Encourage linking large enterprises - SMEs along the supply chain, complying with quality standards and other requirements of enterprises and the market. Finally, enterprises must be steadfast with their long-term strategy toward sustainable development at each stage of development. Businesses can view this as a long-term investment, although it may not lead to immediate economic efficiency in the short term. Finally, the comprehensive literature review situates the current research within the context of broader green business development studies. It highlights the drivers, barriers, and impacts of green practices, identifies gaps in the literature, and underscores the contributions of the current study. This review provides a solid foundation for understanding the importance and relevance of promoting sustainable business practices in Vietnam and beyond.



## 6. Declaration

### 6.1. Author Contributions

Conceptualization: L.P.N., N.Q.H., and P.T.T.; Methodology: P.T.T.; Software: L.P.N.; Validation: L.P.N., N.Q.H., and P.T.T.; Formal Analysis: L.P.N., N.Q.H., and P.T.T.; Investigation: L.P.N.; Resources: P.T.T.; Data Curation: P.T.T.; Writing Original Draft Preparation: L.P.N., N.Q.H., and P.T.T.; Writing Review and Editing: P.T.T. and L.P.N.; Visualization: L.P.N.; All authors have read and agreed to the published version of the manuscript.

### 6.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

### 6.3. Funding

The authors received financial support for the research by Lac Hong University.

### 6.4. Institutional Review Board Statement

Not applicable.

### 6.5. Informed Consent Statement

Not applicable.

### 6.6. Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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